TARGET Overview

TARDEC **G**ated **E**valuation **T**rack
for Technology Development

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

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TARGET Process Support
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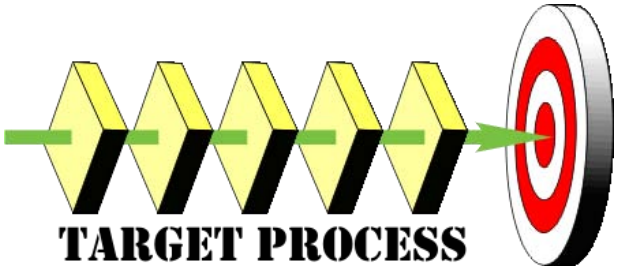
June 2, 2011



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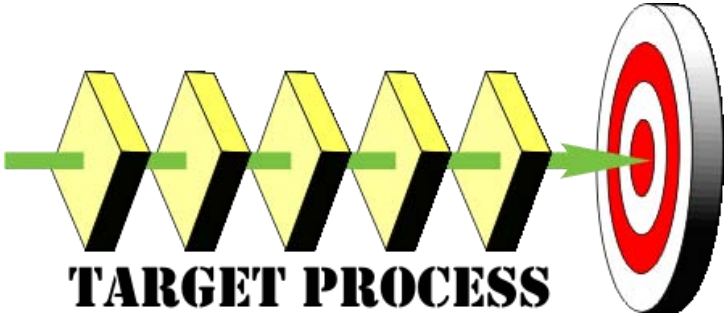
TARGET Mission/Vision

- **Mission**
  - Design, implement and sustain an product development system for science and technology development at TARDEC that integrates proven methodologies including project management, systems engineering, design for six sigma applications and tools.

- **Vision**
  - Enact a robust, systematic and culturally embedded data driven decision methodology for TARDEC technology development by 2013.



Ground Domain Planning Process

Strategic Needs Analysis
- Gather, Analyze, Integrate Needs
- Identify and Prioritize Ground Domain Gaps aligned to Strategic Vectors and time-phased needs.

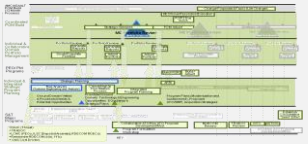
•Identify and Prioritize Gaps

Align Gaps to Strategic Vectors:

• Combat Vehicles • Tactical Vehicles	• Robotics • Base Camps

Strategic Project Planning
- Coordinate Tech Gaps
- Align Acquisition/ST&T Plans and Schedules
- Develop Ground Strategic Technology Plans & Roadmaps
- Annual POM Planning
- Annual Guidance

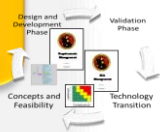
•Align Investments to Vectors (guided by gaps)



Balance Portfolio to align with Vectors
- Assess Balance and Alignment to Strategy
- Refine Recommended Strategy

Project Execution Management
- TARDEC Gated Evaluation Track (TARGET)
- Project Management Best Practice Standardization
- Earn Value Management Training
- Project Governance
- Project Health Dashboard

Manage and Execute Project Plan



Portfolio Assessment

Portfolio Assessment
- Analyze portfolio balance and alignment for leadership and tech developers.
- Monitor portfolio health and assess impacts from changes.

TARGET
Regulations/Requirements

Commercial Best Practices

- *US Government Accountability Office; Best Practices: Stronger Practices Needed to Improve DoD Technology Transition Processes, dtd September 2006*
- *Best Practice Management & SE Practices in the Pre-Acquisition Phase for federal Intelligence and defense agency ; Project Management Journal dtd March 2008*
- *Product Leadership for the Lean Enterprise; Michael Kennedy*
- *Product Leadership; Robert Cooper*
- *Winning at New Products; Robert Cooper*
- *3M Design for Six Sigma Training NPI/NTI*

MIL-STD/HDBK

- *IMP/IMS Preparation and Use Guide, dtd 21 Oct 05 V0.9*
- *MIL-STD 499B System Engineering*
- *PEO Command Control & Communications Tactical , Practical guide for leveraging Science & Technology; "Relevant R&D" vs "Science Projects", dtd Feb 2008*

DAU Documentation

Guidebooks/Policy

- *Defense Acquisition guidebook*
- *CLE031 RDECOM SE Policy*
- *Program Managers e-tool kit*

Continuous Learning Modules

- *CLL015 Business Case Analysis*
- *CLB016 Intro to EVM*
- *CLE045 Into to DoD S&T Management*
- *CLE028 Market Research for Technical Personnel*
- *CLM017 Risk Management*
- *CLE021 Technical Readiness Assessment*
- *CLM 013 Work Breakdown Structure*
- *CLE003 Technical Reviews*
- *CLE026 Trade Studies*

TARDEC Documents

- *ATO-22-3-001 ATO SEP Instructions, dtd 10Dec 08*
- *Draft ATO Managers Handbook, dtd 26 July 09*
- *ATO LSS Process Map*
- *SBIR LSS Process Map*

TARGET Maturity Model:
Iterative Migration to Desired State

2010 → 2011 → 2012 → 2013

Horizon 1

- Pilot(s)
- 50% Solution
- Few Projects
- Shell w/existing processes
- Intro 2-3 Key data tools
- Introduce gating to management
- Exercise system
- Awareness throughout organization
- Specifics localized to those impacted

Horizon 2

- Introduction of a standardized process
- 60% Solution
- Obvious flaws and failure modes fixed.
- Applied to project (s) within each RBG organizations
- Alignment of SE and PM practices
- Introduce Gating and Event Driven Project Management to Organization.
- Detailed Awareness throughout organization

Horizon 3

- Standard Process Gen II
- 80% Solution
- Industry and DoD best practices integrated
- Applied to all projects within RBG
- DFSS & LSS tools integrated
- Data driven culture & fact based decision making promoted
- Fundamental understanding throughout organization
- Awareness with customers and suppliers

Horizon 4

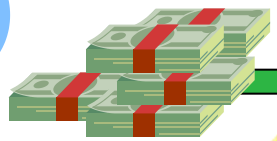
- Living Process
- 99% Solution
- Best Practice & new tools continuously updated by organization
- Fact based/data driven in DNA of organization
- Expansion & integration with other Army & DoD efforts
- Customers and Suppliers understand and use the system.

TARGET
Science & Technology Gated System

Select Funding Path

Limited Spend (Internal Effort)

Seed Money



Major Funding

Ideation & Scoping | Gate 1 | Concepts & Feasiblity | Gate 2 | Design & Development | Gate 3 | Validation | Gate 4 | Technology Transition | Gate 5

Stage 1

High Level Objectives

• Alignment of Project with the big ARMY & TARDEC needs and strategy.

•Understand the current technology landscape-current DoD Projects executing similar mission.

DELIVERABLE: PROJECT CHARTER

Stage 2

High Level Objectives

•Establish Requirements Baseline

•Identify Superior Concept and demonstrate technical feasibility

•Complete TRA/MRA, establish project partners and determine in-house versus contracted Activities

DELIVERABLE: PROJECT PLAN Requirements Baseline

Stage 3

High Level Objectives

•Develop a functional prototype that meets project performance objectives.

•Complete Manufacturing Assessment/ Technology sensitivity assessment

DELIVERABLE: Prototype Manufacturing Req

Stage 4

High Level Objectives

•Validate performance against customer requirements.

•Define the operating range and the interface for technology technology.

DELIVERABLE: Validated Prototype Operations Report

Stage 5

High Level Objectives

• Package the technology

•Complete documentation of development.

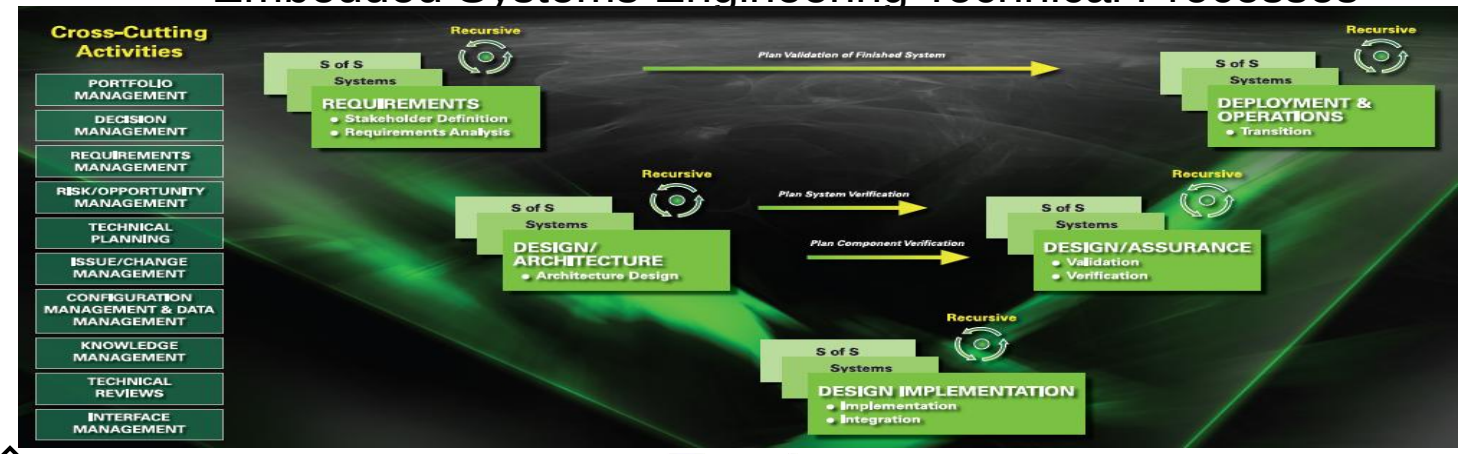
DELIVERABLE: Technology Support to Transition

TARGET
Process Alignment

Ideation & Scoping | Gate 1 | Concepts & Feasiblity | Gate 2 | Design & Development | Gate 3 | Validation | Gate 4 | Technology Transition | Gate 5

Systems Engineering

Embedded Systems Engineering Technical Processes



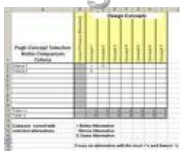
Enablers (DFSS, Tools, SW)

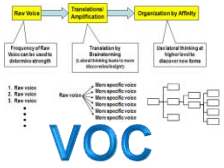
Tools

DOORS

QFD

Pugh





VOC

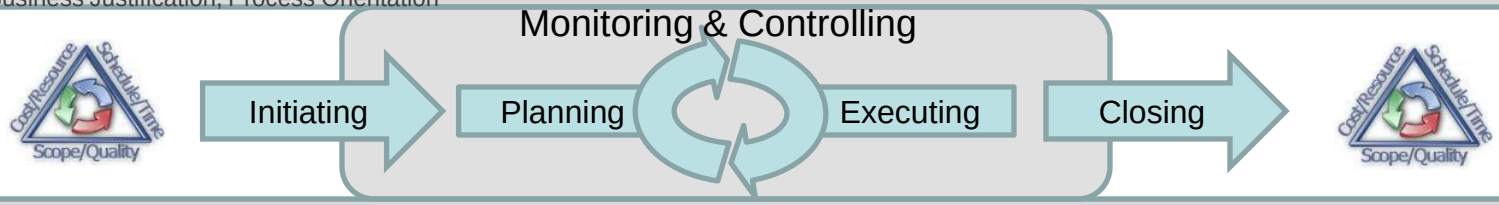
TRL/MRL

Technology Roadmaps

Embedded Project Execution Management Processes

Project Management

- Resource Mgmt, Problem Solving, Tracking/Control, Accountability/ownership, Conflict Management, Strategic Vision, Relationship Mgmt, Business Justification, Process Orientation

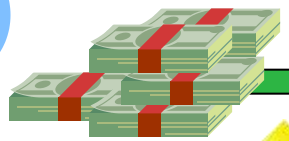


TARGET Process

Select Funding Path

Limited Spend (Internal Effort)

Seed Money



Major Funding

Ideation & Scoping
- Defined Enterprise Goals for Project
- Market/Army Needs Analysis
- Define current Technology Landscape
- Idea Definition
- Defined Alignment w/TARDEC Portfolio
- Identified Customers & Stakeholders
- Project Charter
- Project Plan
- Detailed Plan for C&F
- Gate Documents

Gate 1

Concepts & Feasiblity
- Validated Customer Requirements
- Identified Superior Concept
- Demonstrated Proof of Concept
- Technology Readiness Assessment
- Manufacturing Readiness Assessment
- Value Analysis of Concept (Business case)
- Project Success & Exit Criteria
- Identified Project Partners
- Performance against C&F Project Plan
- Detailed Project Plan for D&D Phase
- Gate Documents

Gate 2

Design & Development
- Completed SE Tech Reviews
- Functional Prototype
- Initial Demonstration Tech Performance Against Requirements
- Critical Parameter Management
- Technology Platform Plan
- Preliminary Manufacturing Assessment
- Performance against D&D Project Plan
- Detailed Project Plan for Validation Phase
- Gate Documents

Gate 3

Validation
- Validated Performance with Customer
- Demonstrated Technology Robustness
- Demonstrated Technology Durability
- Demonstrate Manufacturing Readiness
- Deployment & Integration Plan
- Performance against Validation Project Plan
- Detailed Project Plan for Tech Trans
- Gate Documents

Gate 4

Technology Transition
- Certified Technology Platform
- Deployment & Integration Plan
- Transition Data Package
- Gate Documents

Gate 5

Legend:
Bold-Horizon 2 implementation
Grayed-horizon 3 plus implementation

Phase Deliverables

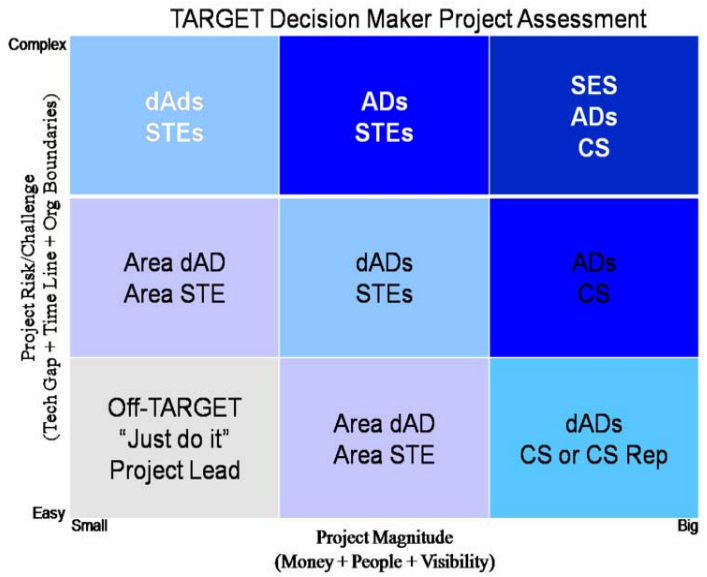
- Specific deliverables aligned to each phase activities designed to reduce programmatic risk
- Identify the right amount of data at the right time to facilitate problem identification and solution
- Recommended activities by commercial best practices and GAO
- Windchill should be used to store and document activities/tools used to fulfill the deliverables
- Templates will be designed to provide best-practice information and expectations for each deliverable

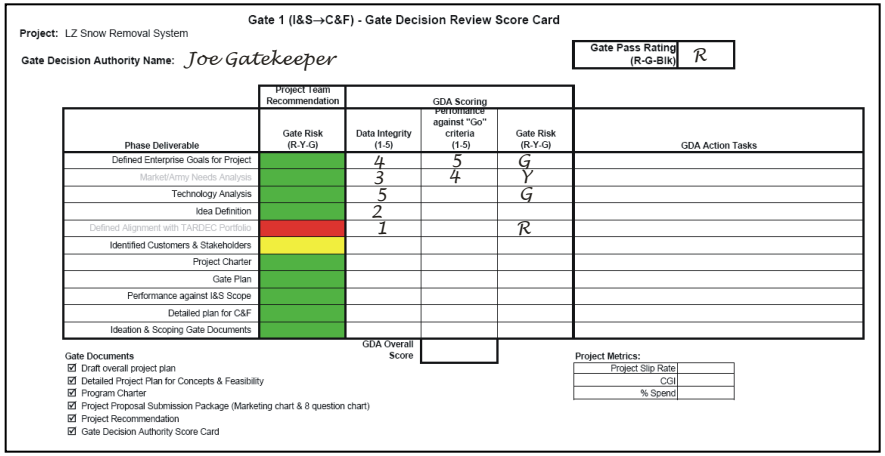
Gate Documentation

- Formalized documents required to be completed and submitted prior to Gate Decision Review
- RDECOM/Systems Engineering required documentation of product development
- Somewhat standard across development system-continuously updating critical information within each phase
- Two Critical Gate Documentations to the project manager
  - Resource requirements for next phase
  - Team Recommended -Gate Decision Authority Score Card
- Data driven documentation based out of the phase deliverables

Gates

- Key **decision** points
  - Is the program healthy, valuable, & have a path forward?
  - Are adjustments needed?
  - Is this program still a top priority?
- Decisions driven by data
- Cross functional review committee – reviewers are responsible, accountable, or supply resources
- Three Areas of focus
  - Project Quality Control
  - Problem Prevention
  - Project Fate Decision
- Outputs
  - Approval status & priority status
  - Work plan for next phase
    - Bounding box for team
    - Resource commitment
    - Timeline to next gate
- Decision process requires two parts:
  - Is the program healthy, valuable, & have a path forward?
  - If yes, what is its priority within the portfolio?





Gate 1 (I&S→C&F) - Gate Decision Review Score Card

Project: LZ Snow Removal System

Gate Decision Authority Name: *Joe Gatekeeper*

Gate Pass Rating (R-G-Blk): *R*

Phase Deliverable	Project Team Recommendation: Gate Risk (R-Y-G)	GDA Scoring: Data Integrity (1-5)	GDA Scoring: Performance against "Go" criteria (1-5)	GDA Scoring: Gate Risk (R-Y-G)	GDA Action Tasks
Defined Enterprise Goals for Project		4	5	G	
Market/Army Needs Analysis		3	4	Y	
Technology Analysis		5		G	
Idea Definition		2			
Defined Alignment with TARDEC Portfolio		1		R	
Identified Customers & Stakeholders					
Project Charter					
Gate Plan					
Performance against I&S Scope					
Detailed plan for C&F					
Ideation & Scoping Gate Documents					
		GDA Overall Score			

Gate Documents
- ☑ Draft overall project plan
- ☑ Detailed Project Plan for Concepts & Feasibility
- ☑ Program Charter
- ☑ Project Proposal Submission Package (Marketing chart & 8 question chart)
- ☑ Project Recommendation
- ☑ Gate Decision Authority Score Card

Project Metrics:

Project Slip Rate	
CGI	
% Spend	

As the gates go, so goes the process – *R. Cooper*

Ideation & Scoping Phase

- Defined Enterprise Goals for Project
- Market/Army Needs Analysis
- Technology Analysis
- Idea Definition
- Defined Alignment w/TARDEC Portfolio
- Identified Customers & Stakeholders
- Project Charter
- Gate Plan
- Performance against I&S Scope
- Detailed Plan for C&F
- Gate Documents

- **Defined to be the Up Front homework phase**
- **Critical Information obtained within this phase**
  - Project alignment with TARDEC core competencies (Strategic Alignment)
  - Identification of potential customer and stakeholders
  - Technology Landscape (State of Art)
  - Identify high level scope and resource requirements
  - Define Project Magnitude and Project Risks/Challenges
  - Charter

NOTE: The defined tasks are identified to be current best practices and may not be all encompassing; additional tasks may be required to resolve the intent of the deliverable and should be documented for others.

Concept & Feasibility Phase

- Validated Customer Requirements
- Identified Superior Concept
- Demonstrated Proof of Concept
- Technology Readiness Assessment
- Value Analysis of Concept (Business case)
- Defined Success & Exit Criteria
- Identified Project Team/Participants
- Performance against C&F Project Plan
- Detailed Project Plan for D&D Phase
- Gate Documents

- **Build the Business Case**
- **Critical Information obtained within this phase**
  - Understanding the customer needs
  - Defining multiple concepts to meet the needs
  - Understand the feasibility to develop those concepts
  - Select superior concept
  - Project entrance and exit criteria
  - Resource requirements

NOTE: The defined tasks are identified to be current best practices and may not be all encompassing; additional tasks may be required to resolve the intent of the deliverable and should be documented for others.

Design & Development Phase

- System Engineering Technical Reviews
- Functional Prototype
- Demonstrated Performance Against Requirements
- Critical Parameter Management Plan
- Technology Platform Plan
- Preliminary Manufacturing Assessment
- Performance against D&D Project Plan
- Detailed Project Plan for Validation Phase
- Gate Documents

- **Defined to be the development of the functional prototype**
- **Critical Information obtained within this phase**
  - Critical parameters that control the ability to meet objectives
  - Manage critical parameters
  - Development of functional prototype
  - Robust design applications
  - Manufacturability assessment

NOTE: The defined tasks are identified to be current best practices and may not be all encompassing; additional tasks may be required to resolve the intent of the deliverable and should be documented for others.

Validation Phase

- Validated Performance with Customer
- Demonstrated Technology Robustness
- Demonstrated Technology Durability
- Demonstrate Manufacturing Readiness
- Deployment & Integration Plan
- **Performance against Validation Project Plan**
- **Detailed Project Plan for Tech Trans**
- **Gate Documents**

- **Defined to be the validation phase**
- **Critical Information obtained within this phase**
  - Project deliverable alignment with program objectives
  - Documentation of Technology Readiness Level 6
  - Operating parameters of technology
  - Technology interface
  - Technology deployment

NOTE: The defined tasks are identified to be current best practices and may not be all encompassing; additional tasks may be required to resolve the intent of the deliverable and should be documented for others.

Technology Transitions

- **Defined to be the hand-off phase**
- **Critical Information obtained within this phase**
  - Transition Data Package
  - Technology form, fit and function
  - Technology documentation

NOTE: The defined tasks are identified to be current best practices and may not be all encompassing; additional tasks may be required to resolve the intent of the deliverable and should be documented for others.